IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	O'HARA et al.	:	Confirmation No.: 3488
Application No.:	10/812,628	:	Group Art Unit: 1742
Filed:	March 29, 2004	:	Examiner: John P. SHEEHAN

For: METHOD FOR SELECTING A REDUCED-TANTALUM SUPERALLOY (amended)

RESPONSE UNDER 37 C.F.R. 1.111

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please consider the following Response for the above-referenced Application.

INTRODUCTORY COMMENTS

This Response is filed in response to the Office Action dated January 4, 2007.

The **Amendments to the Specification** section begins on page 2 of this Response.

The **Amendments to the Claims** section begins on page 4 of this Response and any amendments to the claims are reflected in the listing of the claims included therein.

The **Amendments to the Drawings**: None.

The **Remarks/Arguments** section begins on page 7 of this Response.

The **Conclusion** section begins on page 11 of this Response.

IN THE TITLE:

Please amend the title of the invention at each location where it appears:

~~REDUCED TANTALUM SUPERALLOY COMPOSITION OF MATTER AND ARTICLE MADE THEREFROM, AND~~ METHOD FOR SELECTING A REDUCED-TANTALUM SUPERALLOY

IN THE SPECIFICATION:

Please replace paragraph [0045] with the following rewritten and amended paragraph:

[0045] Studies and calculations were performed to establish limits for the various elements. The following Table I sets for the compositions of alloys actually melted. ~~Alloys E1-E18 are alloys within the scope of the present invention, and alloy~~ Alloy RN5 is commercial Rene^{TM} N5 alloy, which is not within the scope of the invention.

Table I

No.	Al	Ta	Cr	W	Cb	Co	Ti	Hf	Y	Ni
E1	6.25	3.5	6	5	1	10	0	0.15	0.015	63.5
E2	6.25	3.5	6	6	1	10	0	0.15	0.015	62.5
E3	6.25	3.5	6	5	1.5	10	0	0.15	0.015	63.0
E4	6.25	3.5	6	6	1.5	10	0	0.15	0.015	62.0
E5	6.25	3.5	6	5	1	10	0	0.6	0.015	63.1
E6	6.25	3.5	6	6	1	10	0	0.6	0.015	62.1
E7	6.25	3.5	6	5	1.5	10	0	0.6	0.015	62.6
E8	6.25	3.5	6	6	1.5	10	0	0.6	0.015	61.6
E9	6.25	3.5	6	6	1	10	0.3	0.15	0.015	62.2

E10	6.25	3.5	6	5	1.5	10	0.3	0.15	0.015	62.7
E11	6.25	3.5	6	5	1	10	0.3	0.6	0.015	62.8
E12	6.25	3.5	6	6	1.5	10	0.3	0.6	0.015	61.3
E13	6.22	3.5	6	6.5	1.5	10	0	0.15	0.015	61.5
E14	6.22	3.5	6	6.5	1.0	10	0	0.6	0.015	61.5
E15	6.25	4.0	6	5.5	1.3	10	0	0.15	0.015	62.1
E16	6.60	3.5	6	5.5	1.0	10	0.3	0.15	0.015	62.4
E17	6.20	3.5	7	5	1.5	10	0.3	0.15	0.015	61.8
E18	6.20	3.5	7	5	2.0	10	0.3	0.15	0.015	61.3
RN5	6.2	6.5	7	5	0	7.5	0	0.15	0	63.1

Please replace the first paragraph added by the Preliminary Amendment filed 3/29/04 with the following rewritten and amended paragraph:

This application is a division of application Ser. No. 10/229,741, filed August 27, 2002, now abandoned, for which priority is claimed and whose disclosure is incorporated by reference in its entirety.

IN THE CLAIMS:

This listing of the claims will replace all prior versions, and listings of the claims in the Application.

1. – 14. (Cancelled)

15. (Currently amended) A method for selecting a reduced-cost nickel-base superalloy, the method comprising the steps of

identifying a baseline nickel-base superalloy having a nominal composition, in weight percent, comprising

a baseline tantalum content of more than about 5 weight percent tantalum, and

a baseline sum (baseline hafnium content plus baseline columbium content plus baseline titanium content plus baseline tungsten content), in weight percent,

selecting a modified nickel-base superalloy having a nominal composition, in weight percent, comprising

a modified tantalum content at least 1.5 weight percent less than the baseline tantalum content, and

a modified baseline sum of (modified hafnium content plus modified columbium content plus modified titanium content plus modified tungsten content) at least 1.5 weight percent greater than the baseline sum.

16. (Original) The method of claim 15, wherein the step of selecting includes the step of

selecting an absolute value of (the modified baseline sum minus the baseline sum) to be at least as great as the absolute value of (the modified tantalum content minus the baseline tantalum content).

17. (Original) The method of claim 15, wherein the step of selecting includes the step of

selecting the modified nickel-base superalloy to have a nonzero modified hafnium content, a nonzero modified columbium content, a nonzero modified titanium content, and a nonzero modified tungsten content.

18. (Original) The method of claim 15, wherein the sum of the modified tungsten content plus a modified molybdenum content in the modified nickel-base superalloy is at least about 6.5 weight percent.

19. (Original) A method for selecting a reduced-cost nickel-base superalloy, the method comprising the steps of

identifying a baseline nickel-base superalloy having a nominal composition, in weight percent, comprising

a baseline tantalum content of more than about 5 weight percent tantalum, and

a baseline sum (baseline hafnium content plus baseline columbium content plus baseline titanium content plus baseline tungsten content), in weight percent,

selecting a modified nickel-base superalloy having a nominal composition, in weight percent, comprising

a modified tantalum content at least 1.5 weight percent less than the baseline tantalum content, and

a modified baseline sum of (modified hafnium content plus modified columbium content plus modified titanium content plus modified tungsten content) at least 1.5 weight percent greater than the baseline sum, wherein

an absolute value of (the modified baseline sum minus the baseline sum) is at least as great as the absolute value of (the modified tantalum content minus the baseline tantalum content),

wherein the modified nickel-base superalloy has a nonzero modified hafnium content, a nonzero modified columbium content, a nonzero modified titanium content, and a nonzero modified tungsten content, and

wherein the sum of the modified tungsten content plus a modified molybdenum content in the modified nickel-base superalloy is at least about 6.5 weight percent.

20. (New) The method of claim 15, including an additional step, after the step of selecting, of

preparing an article made of the modified nickel-base superalloy.

21. (New) The method of claim 15, including an additional step, after the step of selecting, of

preparing an article made of the modified nickel-base superalloy, wherein the article is shaped as a component of a gas turbine engine.

22. (New) The method of claim 19, including an additional step, after the step of selecting, of

preparing an article made of the modified nickel-base superalloy.

23. (New) The method of claim 19, including an additional step, after the step of selecting, of

preparing an article made of the modified nickel-base superalloy, wherein the article is shaped as a component of a gas turbine engine.

Remarks

This application has been reviewed in light of the Office Action of January 4, 2007. Claims 15-19 are pending, and all claims are rejected. In response, the title of the invention is amended; the Specification is amended; claim 15 is amended; new claims 20-23 are added; and the following remarks are submitted. Reconsideration of this application is respectfully requested.

The Specification is amended, as suggested by the Examiner.

Ground 1. Claims 15-19 are rejected under 35 USC 103 (a) as being unpatentable over Henry U.S. Patent 4,388,124 ("Henry"). Applicant respectfully traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the single applied prior art reference clearly does not arguably teach some limitations of the claims.

The present invention is directed to a "method for selecting a reduced-cost nickel-base superalloy." It requires first "identifying a baseline nickel-base superalloy," and then "selecting a modified nickel-base superalloy" derived from the composition modified nickel-base superalloy. That is, the method involves first identifying the baseline nickel-base superalloy, and then modifying its composition to reach the "modified nickel-base superalloy." The objective, as discussed in the Specification, is to reduce the amount of the high-cost tantalum alloying element.

Henry teaches alloy compositions but not, as far as Applicant can tell, a "method for selecting a reduced-cost nickel-base superalloy" as recited in claims 15-19.

Each of claims 15 and 19 recites in part:

"selecting a modified nickel-base superalloy having a nominal composition, in weight percent, comprising

a modified tantalum content at least 1.5 weight percent less than the baseline tantalum content, and

a modified baseline sum of (modified hafnium content plus modified columbium content plus modified titanium content plus modified tungsten content) at least 1.5 weight percent greater than the baseline sum."

The explanation of the rejection, at page 3, lines 8-13, references compositions taught by Henry in the Abstract and in the Table found in column 4. The explanation of the rejection asserts that "Henry teaches a nickel-base superalloy having a composition that overlaps the nickel base superalloy recited in the instant claims." The present claims do not recite a nickel-base superalloy composition, but instead recites a method wherein a step of the method includes selecting a nickel based super alloy. The explanation of the rejection then goes on to recognize that Henry does not teach the steps of "identifying a baseline alloy" and "selecting a modified nickel-base superalloy." The paragraph bridging pages 3-4 argues an overlap in Ta proportions. That argued overlap is not technically correct, because the selecting step speaks of differences, not absolute values.

Applicant understands that an attempt to rely on In re Peterson and related cases provides an opportunity to reject composition claims on unrelated art, but these are not composition claims. No compositions are recited. The claims instead are to a method of designing an alloy starting with a baseline alloy, which Henry does not address at all. In re Peterson and related cases have no application here.

Further, the claims recite compensating for the decrease in tantalum content by increasing a specific combination of other elements "sum (hafnium content plus columbium content plus titanium content plus tungsten content)." What the inventors found is that expensive tantalum can be replaced with these less expensive elements while achieving comparable performance (Specification, para. [0007]). Henry has nothing to do with that.

If the rejection is maintained, Applicant asks that the Examiner indicate the specific location in Henry where the steps of identifying and selecting are taught, and exactly what are the "baseline nickel-base superalloy" and the "baseline nickel-base superalloy" compositions taught by Henry.

Ground 2. Claims 15-19 are rejected under 35 USC 103 (a) as being unpatentable over Darolia U.S. patent 6,444,057 ("Darolia") or Tamaki U.S. Patent 6,051,083 ("Tamaki"), each reference taken by itself. Applicant respectfully traverses this ground of rejection.

The issue here for each of the references is substantially the same as for the Ground 1 rejection. The discussion of the Ground 1 rejection is incorporated, except modified to address the teachings of Darolia and Tamaki.

The present invention is directed to a "method for selecting a reduced-cost nickel-base superalloy." It requires first "identifying a baseline nickel-base superalloy," and then "selecting a modified nickel-base superalloy" derived from the composition modified nickel-base superalloy. That is, the method involves first identifying the baseline nickel-base superalloy, and then modifying its composition to reach the "modified nickel-base superalloy." The objective, as discussed in the Specification, is to reduce the amount of the high-cost tantalum alloying element.

Each of the references teaches alloy compositions but not, as far as Applicant can tell, a "method for selecting a reduced-cost nickel-base superalloy" as recited in claims 15-19.

Each of claims 15 and 19 recites in part:

> "selecting a modified nickel-base superalloy having a nominal composition, in weight percent, comprising
>
> a modified tantalum content at least 1.5 weight percent less than the baseline tantalum content, and
>
> a modified baseline sum of (modified hafnium content plus modified columbium content plus modified titanium content plus modified tungsten content) at least 1.5 weight percent greater than the baseline sum."

The explanation of the rejection, at page 4, lines 14-20, references compositions taught by Darolia at col. 1, lines 54-59 and Tamaki at col. 1, lines 6-15. The explanation of the rejection asserts that "Each of the references teaches a single crystal nickel base superalloy...having a composition that overlaps the instantly claimed alloy." The present claims do not recite a nickel-base superalloy composition, but instead recites a method wherein a step of the method includes selecting a nickel based super alloy. The explanation of the rejection then goes on to recognize that the two references do not teach

the steps of "identifying a baseline alloy" and "selecting a modified nickel-base superalloy." The first paragraph on page 5 argues an overlap in Ta proportions. That argued overlap is not technically correct, because the selecting step speaks of differences, not absolute values.

Applicant understands that an attempt to rely on In re Peterson and related cases provides a nice opportunity to reject composition claims on unrelated art, but these are not composition claims. No compositions are recited. The claims instead are to a method of designing an alloy starting with a baseline alloy, which the references do not address at all. In re Peterson and related cases have no application here.

Further, the claim recites compensating for the decrease in tantalum content by increasing a specific combination of other elements "sum (hafnium content plus columbium content plus titanium content plus tungsten content)." What the inventors found is that expensive tantalum can be replaced with these less expensive elements while achieving comparable performance (Specification, para. [0007]). Neither of the references has anything to do with that.

If the rejection is maintained, Applicant asks that the Examiner indicate the specific location in the references where the steps of identifying and selecting are taught, and exactly what are the "baseline nickel-base superalloy" and the "baseline nickel-base superalloy" compositions taught by the references.

Applicant submits that the application is in condition for allowance, and requests such allowance.

CONCLUSION

For at least the reasons set forth above, Applicant respectfully requests reconsideration of the Application and withdrawal of all outstanding rejections. Applicant requests allowance of all pending claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant's undersigned representative.

This Response has been filed within three (3) months of the mailing date of the Office Action and it is believed that no fees are due with the filing of this paper. In the event that Applicant is mistaken in these calculations, the Commissioner is hereby authorized to deduct any fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Respectfully submitted,

Dated: April 4, 2007

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